

# **Belcom Microwaves Ltd.**

## **Medium Power BUC**

### **Models: BLC-10/20/25/40/50**



## **User Manual**

**Manual P/N: MB1052, Revision 4.0**

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**July 2013**

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4.0	July 2013	- Technical updates - Formatting - Addition of Detectors Calibration Tables (Appendix F) - Updates of Assembly Kits	

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## List of Acronyms and Abbreviations

1dBcp:	One dB Compression Point	Kg:	Kilogram
A:	Ampere	KHz:	Kilohertz
AC:	Alternate Current	L:	Length
BUC:	Block Up Converter	M&C:	Monitor & Control
C:	Celsius	MHz:	Megahertz
CIF:	Cost, Insurance, and Freight	NEC:	National Electrical Code
dB:	Decibel	OMT:	Ortho Mode Transducer
dBc:	Decibel (referenced to carrier)	PE:	Protective Earth
dBm:	decibel (referenced to 1 mWatt)	PLL:	Phase Locked Loop
DC:	Direct Current	PTP:	Peak to Peak
DCA:	Digital Controlled Attenuator	RF:	Radio Frequency
GHz:	Giga Hertz	RMA:	Return Material Authorization
GND:	Ground	SCPC:	Single Channel Per Carrier
H:	Height	VSAT:	Very Small Aperture Terminal
Hz:	Hertz	VSWR:	Voltage Standing Wave Ratio
IF:	Intermediate Frequency	W:	Watts, Width
IFL:	IF L-Band		

## Safety Instructions Definitions

### Définition des Consignes de Sécurité



#### **WARNING**

An operating procedure, practice, and so forth, which, if not correctly followed, could result in personal injury or loss of life.

Handle this product only as instructed in this manual. Do not attempt to operate or maintain this product in a manner not specifically stated in this manual.

#### **AVERTISSEMENT**

Manipuler ce produit uniquement selon les instructions de ce manuel.

Si le mode de fonctionnement ou l'utilisation n'est pas suivi correctement, cela peut entraîner des blessures personnelles ou des dommages irréversibles.

Ne tentez pas d'exploiter ou d'entretenir ce produit d'une manière qui n'est pas expressément indiquée dans ce manuel.



#### **CAUTION**

An operating procedure, practice, and so forth, which if not strictly observed, could result in damage to or destruction of equipment.

#### **AVERTISSEMENT**

Si le mode de fonctionnement ou l'utilisation ne sont pas strictement observés, le résultat pourrait entraîner des dommages ou la destruction de l'équipement.



#### **NOTE**

An operating procedure, practice, and so forth, which is recommended to highlight for better work order or for efficiency.

#### **NOTE**

Une méthode de fonctionnement et d'utilisation recommandée et mise en évidence pour meilleure séquence de travail et une meilleure efficacité.



## General Safety Guidelines

- The unit should be located in a Restricted Access Location (RAL) - access should be allowed to service personnel only.
- The unit is required to be connected to the earthing of the building structure. Grounding is provided via the OMT waveguide flange and through the antenna pole. All 8 screws connecting the unit to the OMT are to be securely tightened. The installer shall verify that the antenna is bonded to the building structure ground.
- The earthed side of the unit is connected to the shielding of the coax cable and the shielding is should be earthed in the building infrastructure.
- AC Supply
  - use with a 10 A fuse/circuit-breaker.
  - Only cables that are approved by the local agency and comply with the temperature and power rating should be used.
  - Power cable connection should be carried out only by authorized personnel as stated by the local agency laws.
  - Always use the correct power as labeled on the BUC.
- DC Supply:
  - Use +48V power supply (60V max) with output current limit of 5A, which complies with CE safety requirements.
  - Use local agency approved cable that complies with the temperature and power rating.
- When servicing the BUC, obey all safety instructions related to transmitting antennas maintenance.
- Caution: hot surface while in operation, do not touch.



### CAUTION

Always observe standard safety precautions during installation, operation and maintenance of this product !



# 1. Introduction

This chapter introduces Belcom Microwaves Ltd. Block Up Converters.

The chapter is comprised of the following sections:

- Section 1.1: [System Overview](#)
- Section 1.2: [BUC Overview](#)
- Section 1.3: [Features and Advantages](#)
- Section 1.4: [Available Models and Configurations](#)
- Section 1.5: [BUC General Description](#)
- Section 1.6: [DC Power Inserter](#)

## 1.1 System Overview

The BLC series BUC serves as an IF to RF converter and power amplifier in satellite communication terminals.

A satellite communication terminal main parts are: a Block Up Converter (BUC), a Low Noise Block down converter (LNB), a modem, an antenna, a feed and all the cables and accessories that are required for the operation of the system.

This manual refers only to the BUC and the DC Power Inserter. The DC Power Inserter serves as the power source of the DC models BUCs, which are powered via the IF L-Band (IFL) cable.

## 1.2 BUC Overview

The BLC products are high linearity Block Up Converters (BUC).

They serve in satellite communication systems and operate at the C frequency bands.

The BLC products are operated either using DC or AC power, applied via either the IFL cable or a dedicated connector, depending on the model (See paragraph 1.3).

**Figure 1-1: BLC Family General View**



### 1.3 Features and Advantages

The BLC products features and advantages are:

- An outdoor sealed unit
- Operating temperature: -40°C to +55°C
- Easy installation and operation
- High reliability
- Designed for either VSAT or SCPC applications
- Can be mounted either on top or beneath the antenna boom
- BLC-to-OMT flexible waveguide is available upon request
- BLC powering available options:
  - 90 - 230 VAC
  - 48 (38 - 62) VDC via DC connector
  - 48 (38 - 62) VDC via IFL cable (BLC-10/20/25 only)
  - 24 (18 - 26) VDC via IFL cable (BLC-10 only)
- Supported by Belcom Microwaves Ltd.

Optional Power Supply Configurations:

Output Power [Watts]	AC Via external Connector	DC	
		Via IFL Cable*	Via External Connector
10	√	√	√
20	√	√	√
25	√	√	√
40	√	-	√
50	√	-	√

\* In case the modem is not capable of supplying the required power, a DC Power Inserter (model A1007) is required for powering the BUC via the IFL cable. The DC Power Inserter is connected between the modem and the BUC. (see [Figure 2-5](#) for cable connection instructions).

1.4 Available Models and Configurations

Table 1-1: Available Models and Configurations

Model	Output Power @ P1dBcp (W)	Input Frequency (MHz)	Output Frequency (GHz)	LO Frequency (GHz)	Input Voltage	Power Feed Options	M&C	Power Consumption (W)	Weight (Kg)
BLC-10	10	950 - 1525	5.850 - 6.425	4.900	48VDC standard 24VDC or 90-230VAC (optional)	DC Via IFL cable: standard. DC Via external connector: optional	Optional	DC: 90 AC: 100	DC - 7.2 AC - 12
BLPA-10		1075 - 1435	6.365 - 6.725	5.290					
BLIN-10		975 - 1275	6.725 - 7.025	5.750					
BLWC-10		950 - 1825	5.850 - 6.725	4.900					
BLC-20	20	950 - 1525	5.850- 6.425	4.900	48VDC or 90-230VAC	DC via IFL cableor AC via external connector DC via external connector: optional		DC: 170 AC: 190	
BLPA-20		1075 - 1435	6.365 - 6.725	5.290					
BLIN-20		975 - 1275	6.725 - 7.025	5.750					
BLWC-20		950 - 1825	5.850 - 6.725	4.900					
BLC-25	25	950 - 1525	5.850- 6.425	4.900				DC: 210 AC: 230	
BLPA-25		1075 - 1435	6.365 - 6.725	5.290					
BLIN-25		975 - 1275	6.725 - 7.025	5.750					
BLWC-25		950 - 1825	5.850 - 6.725	4.900					
BLC-40	40	950 - 1525	5.850 - 6.425	4.900	AC via external connector Or DC via external connector: optional	DC: 380 AC: 400		12	
BLPA-40		1075 - 1435	6.365 - 6.725	5.290					
BLIN-40		975 - 1275	6.725 - 7.025	5.750					
BLWC-40		950 - 1825	5.850 - 6.725	4.900					
BLC-50	50	950 - 1525	5.850 - 6.425	4.900					

\* See [Appendix L: BLC Technical Specifications](#) for complete specifications

## 1.5 BUC General Description

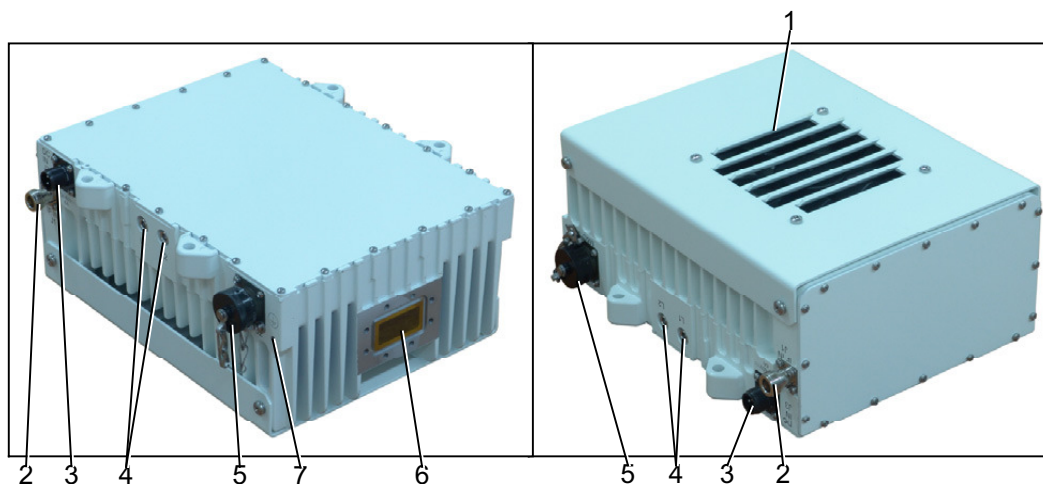
### 1.5.1 BLC-10/20/25 DC

(See [Figure 1-2](#))

The following items are located on the BUC outer surface:

1. **Fan:** Regulates the temperature of the BUC inner space.
2. **J1:** IF Input Connector
3. **J3:** External Power Supply Connector (optional)
4. **L1, L2 Indicators:** Three-state indicators (ON, OFF or blinking), indicate the status of the BUC.
5. **J2:** M&C Connector (optional).
6. **CPR137G Flange:** RF output.
7. **Ground Terminal Connection**

*Figure 1-2: BUC General Description - BLC-10/20/25 DC*



**Legend:**

- |                                       |                               |
|---------------------------------------|-------------------------------|
| 1. Fan                                | 5. J2 M&C Connector           |
| 2. J1 IF Input Connector              | 6. CPR137G Flange             |
| 3. J3 External Power Supply Connector | 7. Ground Terminal Connection |
| 4. L1, L2 Indicators                  |                               |

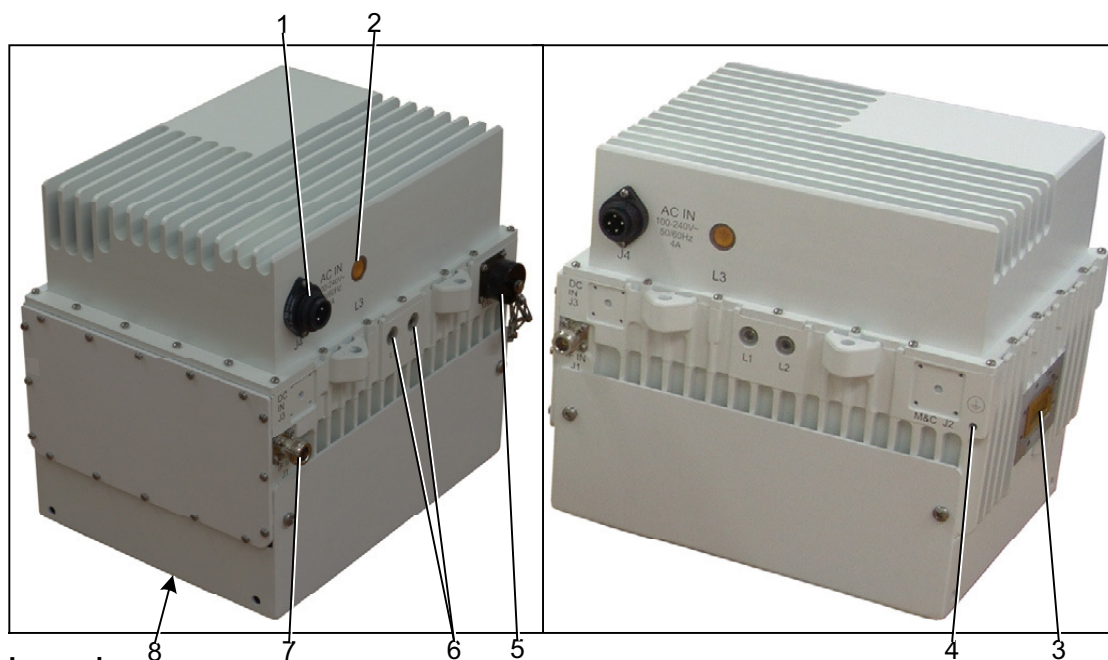
### 1.5.2 BLC-10/20/25/40/50 AC and BLC-40/50 DC

(See [Figure 1-3](#))

The following items are located on the BUC outer surface:

1. **J4**: External Power Supply Connector.
2. **L3**: AC/DC Power Indicator (Orange).
3. **CPR137G RF Flange**: RF output.
4. **Ground Terminal Connection**
5. **J2**: M&C Connector (optional).
6. **L1, L2 Indicators**: Three-state indicators (ON, OFF or blinking), indicate the BUC status(see table 3-1, page 3-2).
7. **J1**: IF Input (IFL) Connector (N-Type): Modem or DC Power Inserter to BUC cable connection.
8. **Fan** (not shown): Regulates the temperature of the BUC inner space.

**Figure 1-3: BUC General Description - BLC-10/20/25/40/50 AC and BLC-40/50 DC**



**Legend:**

- |                                       |                                |
|---------------------------------------|--------------------------------|
| 1. J4 External Power Supply Connector | 5. J2 M&C Connector (optional) |
| 2. L3 AC/DC Power Indicator           | 6. L1, L2 Indicators           |
| 3. CPR137G RF Flange                  | 7. J1 IF Input (IFL) Connector |
| 4. Ground Terminal Connection         | 8. Fan                         |

## 1.6 DC Power Inserter

### 1.6.1 DC Power Inserter Overview

The DC Power Inserter is an indoor unit that receives IF and 10 MHz signals from the modem, combines them with DC power, which is required to power the BUC and delivers it to the BUC via the IFL cable.

In any case, the DC Power Inserter blocks any possible DC voltage coming from the modem.

The total IF signal attenuation in the DC Power Inserter can be manually adjusted by the user, using an internal DCA. The DCA does not influence the 10 MHz reference power level and the DC supply.

A DC Power Inserter is required between the modem and the BUC, where the modem is not capable of supplying the required DC power.

A 10 MHz internal reference option is available to be used where the modem does not provide this signal.



#### NOTE

The DC Power Inserter is in use only with BLC-10/20/25 DC operated models (via IFL)!



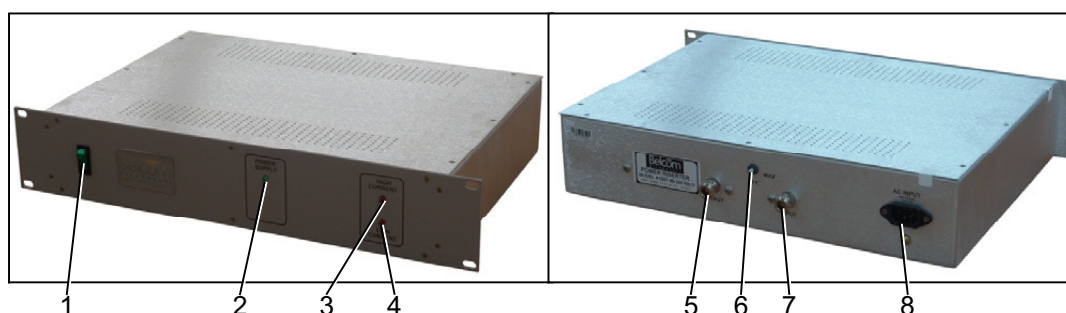
### 1.6.2 DC Power Inserter General Description

(See [Figure 1-4](#))

The following items are located on the DC Power Inserter outer surface:

1. **ON/OFF Power Switch** (illuminated): Switches the DC Power Inserter on and off.
2. **POWER SUPPLY Indicator (green)**: Indicates proper output voltage. The indication turns off when output voltage is below 46V (With standard 48V output voltage) or below 22V (With the 24V output voltage option).
3. **HIGH CURRENT Indicator (red)**: Indicates output current higher than 6A.
4. **LOW CURRENT Indicator (red)**: Indicates output current below 0.8A.
5. **OUTPUT Connector**: Provides IF, DC and 10 MHz reference to the BUC.
6. **DCA Rotary Switch**: Sets the internal IF attenuation.
7. **INPUT Connector**: IFL input from the modem.
8. **AC INPUT Socket**: Power line inlet.

**Figure 1-4: DC Power Inserter**



**Legend:**

- |                           |                      |
|---------------------------|----------------------|
| 1. ON/OFF Power Switch    | 5. OUTPUT Connector  |
| 2. POWER SUPPLY Indicator | 6. DCA Rotary Switch |
| 3. HIGH CURRENT Indicator | 7. INPUT Connector   |
| 4. LOW CURRENT Indicator  | 8. INPUT Connector   |

For additional detailed information about the DC Power Inserter refer to the *DC Power Inserter User Manual*.



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## 2. Handling and Installation

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This chapter provides instructions on how to handle and install the BLC-10/20/25/40/50 products.

The chapter is comprised of the following sections:

- Section [2.1: Handling](#)
- Section [2.2: Unpacking](#)
- Section [2.3: Installation](#)
- Section [2.4: Post Installation Checks](#)

### 2.1 Handling

#### 2.1.1 Transportation

The BLC-10/20/25/40/50 may be transported by land, air or sea while packed in the original package:

**Figure 2-1: The BLC & DC Power Inserter Packages**



### 2.1.2 Storage

While packed in its original package, the BLC-10/20/25/40/50 and DC Power Inserter may be stored in the following conditions:

- Temperature Range: 0 to 50°C
- Relative Humidity: up to 95% (non-condensing)

### 2.1.3 Return of Equipment



#### NOTE

Do not return any equipment without a return material authorization (RMA) number. This is important for prompt and efficient handling of the returned equipment and of the associated complaint.

When returning equipment to Belcom Microwaves Ltd. for repair or replacement:

1. Identify, in writing, the condition of the equipment.
2. Refer to the purchase order and the date the equipment was received.
3. Notify Belcom Microwaves Ltd. customer service department of the equipment condition and obtain an RMA number and shipping instructions. Consult Belcom Microwaves Ltd. customer service department for the best shipment method.

### 2.1.4 Equipment Damage or Loss

Belcom Microwaves Ltd. is responsible for damage or loss of equipment only if the purchase order included a "door-to-door" delivery (Cost, Insurance, and Freight - CIF by INCOTERM). Otherwise, contact the responsible transport carrier.

When declaring equipment as damaged during shipment, preserve the original shipping cartons to facilitate inspection reporting.

Nevertheless, it is recommended to contact Belcom Microwaves Ltd. which will make an effort to assist in any case of damage or loss of equipment.

### 2.1.5 Receiving and Inspection



#### CAUTION

Handle the BUC with extreme care. Excessive shock might damage the BUC.

The BUC is designed to function outdoors and will arrive in a standard shipping container. Immediately upon receipt of the BUC, check the packing list against the actual equipment you have received. Inspect the shipping containers exteriors for visible damage incurred during shipping.

## 2.2 Unpacking



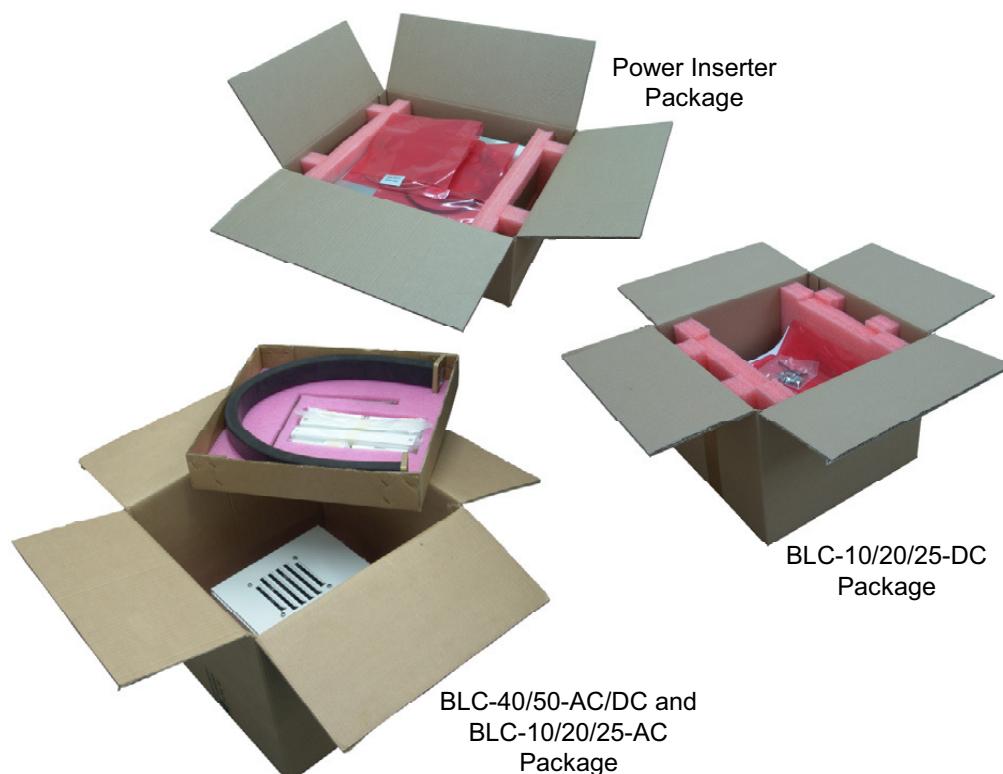
### CAUTION

Mind the "This Side UP" and "Open this End" labels.

### 2.2.1 Unpacking Instructions

1. Visually inspect the package for traces of excessive moisture or external damage.
2. Carefully open the package, observing all handling labels ("This Side Up", "Open This End", "Fragile", etc.).
3. A general view of the open packages are shown in [Figure 2-2](#):

**Figure 2-2:** *BLC-10/20/25/40/50 and DC Power Inserter Packages Open View*



4. Verify that all items in the packing list were received undamaged (see [Appendix A - Appendix D](#)). If there are any omissions or evidence of improper packaging, please notify Belcom Microwaves Ltd. immediately.



### NOTE

Do not peel the sealing of the waveguide port. It is there for sealing the unit!

## 2.3 Installation

This section contains installation instructions of the following products:

- Section [2.3.1: BLC-10/20/25 DC Installation](#)
- Section [2.3.2: BLC-10/20/25/40/50 AC and BLC-40/50 DC Installation](#)
- Section [2.3.3: DC Power Inserter Installation](#)
- Section [2.3.4: BUC Powered by a DC Power Inserter via IFL Cable Connections](#)
- Section [2.3.5: BLC-10/20/25/40/50 AC and External DC Cable-Connection](#)



### **WARNING**

Disconnect the unit from the mains before starting the installation. Failure to comply could result in injury to personnel or damage the equipment!



### **WARNING**

The equipment must be properly grounded according to the NEC and other local safety code requirements. Failure to comply could result in personnel injury or loss of life.



### **CAUTION**

If the unit has the M&C option, make sure that the dust cover of the M&C connector (J2) is properly closed when not in use.



### **CAUTION**

It is essential to seal all the connectors on the BUC (i.e. the IF cable connector, the power supply and the M&C) using a sealing tape (such as LeMark PN RT24 or equivalent).



### **CAUTION**

Verify that the cables are not bent or strained, especially near the connectors.



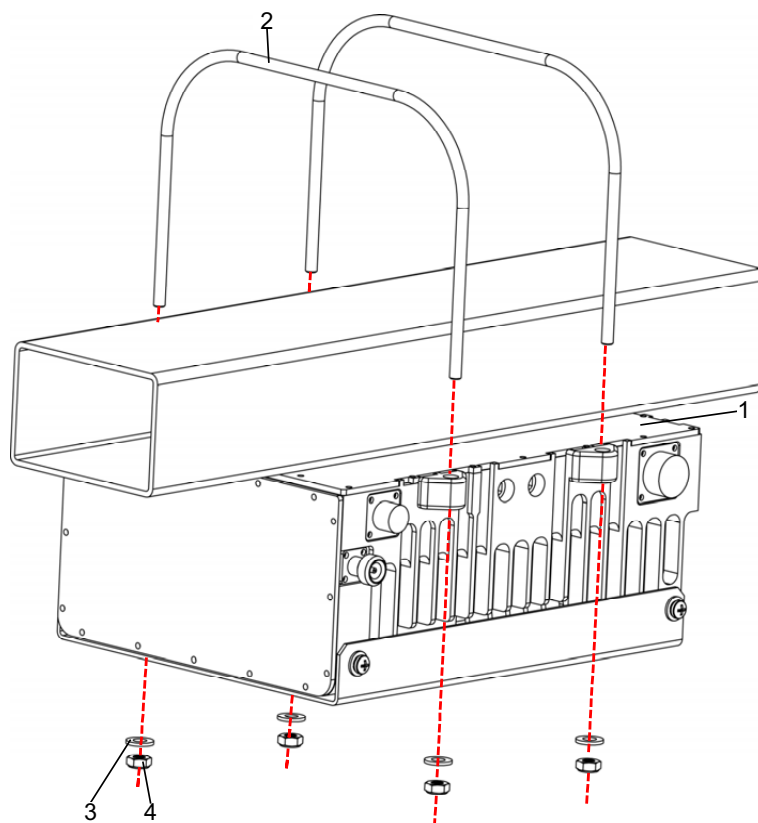
### **CAUTION**

Verify that the cable-connectors are sealed and water draining along the cables can't penetrate into the connectors.

### 2.3.1 BLC-10/20/25 DC Installation

Fasten the BUC (1) to the boom using two mounting clamps (2), four hex nuts (4) and four washers (3) as shown in [Figure 2-3](#):

**Figure 2-3: BLC-10/20/25 DC Installation**



**Legend:**

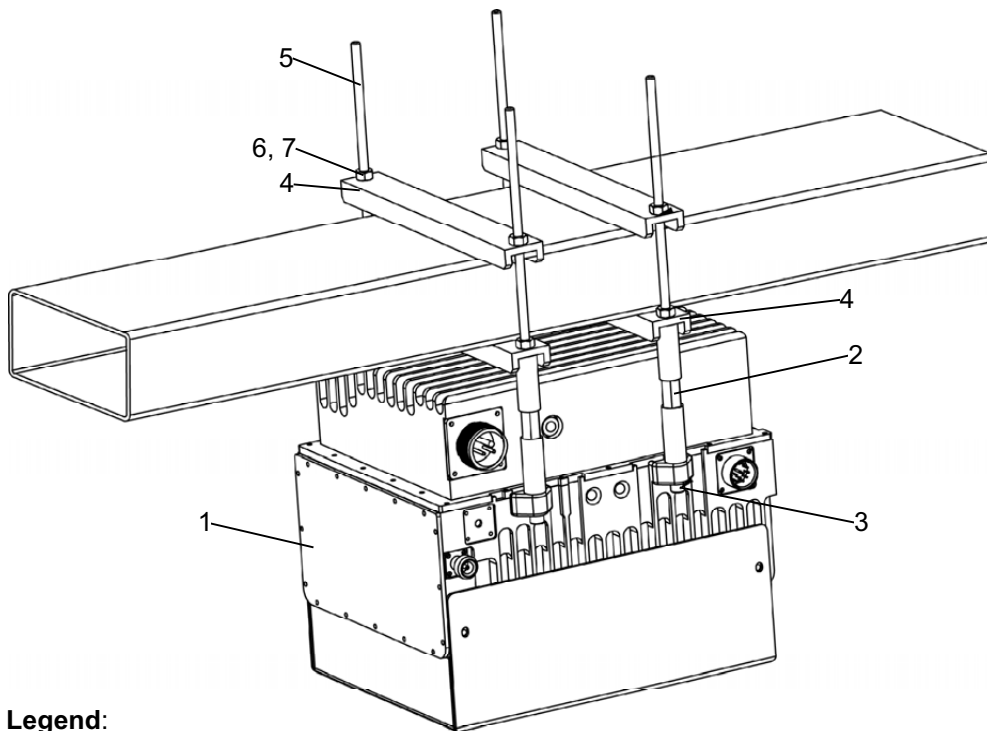
- 1. BLC-10/20/25W
- 2. Mounting Clamp (x2)
- 3. Flat Washer 1/4"-20x1 (x4)
- 4. Hex Nut 1/4"-20 with Lock (x4)

### 2.3.2 BLC-10/20/25/40/50 AC and BLC-40/50 DC Installation

(See [Figure 2-4](#))

1. Mount four spacers (2) on the BUC(1) and fasten using four screws (3).
2. Mount the two lower Flanges (4) on the Spacers (2).
3. Attach four shafts (5) to the spacers (2) and fasten using the nut.
4. Attach the BUC to the boom using the two upper flanges (4) and fasten using four nuts (6) and eight washers (7).

**Figure 2-4: BLC-10/20/25/40/50 AC and BLC-40/50 DC Installation**



**Legend:**

- |                |  |
|----------------|--|
| 1. BLC         | 5. Shaft (x4; including Hex Nut 1/4"-20) |
| 2. Spacer (x4) | 6. Hex Nut 1/4"-20 with Lock (x8)        |
| 3. Screw (x4)  | 7. Flat Washer 1/4"-20x1 (x8)            |
| 4. Flange (x4) |  |



### 2.3.3 DC Power Inserter Installation



#### CAUTION

Disconnect the unit from the mains before starting the installation.

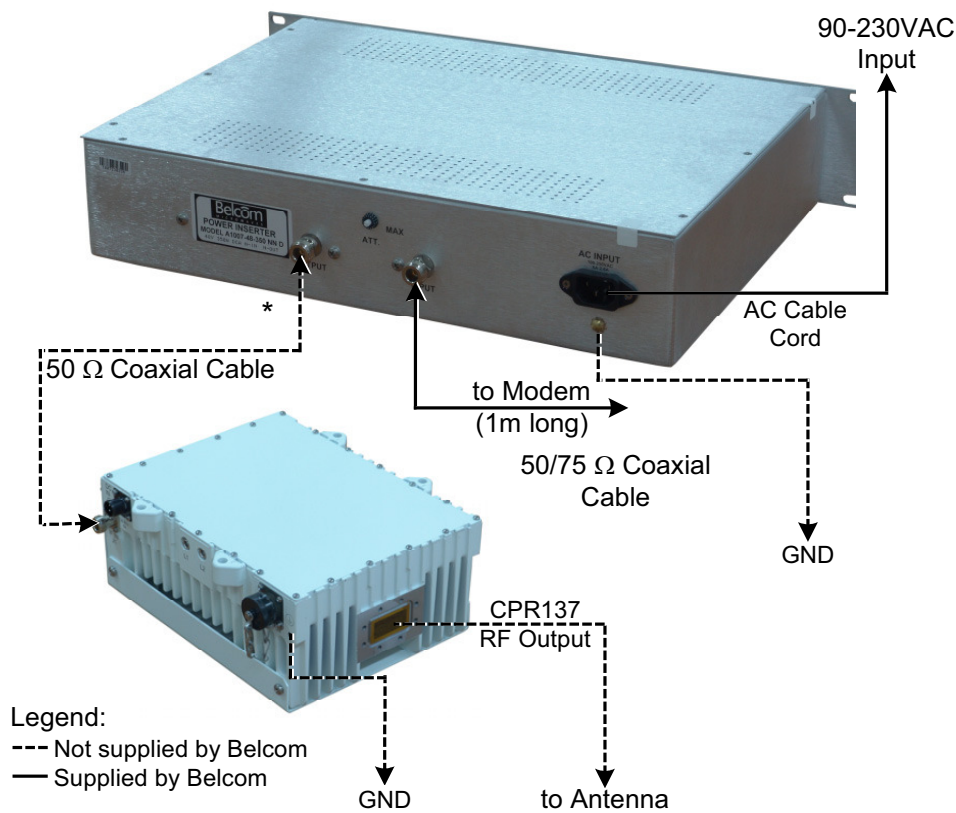
1. Mount the DC Power Inserter onto a 19" rack.
2. Allow free air convection. Do not block the ventilation holes in the lower and upper face of the unit.

### 2.3.4 BUC Powered by a DC Power Inserter via IFL Cable Connections

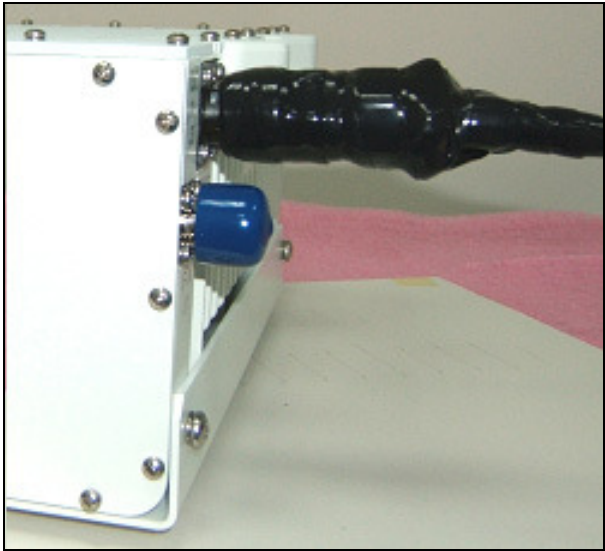
Connect the BUC and the DC Power Inserter as shown in [Figure 2-5](#):

1. Connect the IF output of the modem to the INPUT connector of the DC Power Inserter, using the coax cable (supplied with the DC Power Inserter).
2. Connect the OUTPUT of the DC Power Inserter to the input connector of the BUC (J1), using an appropriate coax cable (not supplied).
3. Connect the BUC CPR137G output to the OMT, using an appropriate waveguide. At the BUC side, use screw kit P/N A10559 (supplied).
4. At the OMT side, use screw kit P/N A11479 (Supplied with the optional flexible waveguide).
5. Connect the BUC GND point to the infrastructure ground, using a standard GND cable.
6. Connect the DC Power Inserter to the mains, using a standard power cable.
7. Seal all the connectors on the BUC, using a sealing tape (see [Figure 2-6](#)).

**Figure 2-5:** BUC Powered by a DC Power Inserter via IFL Cable Connections



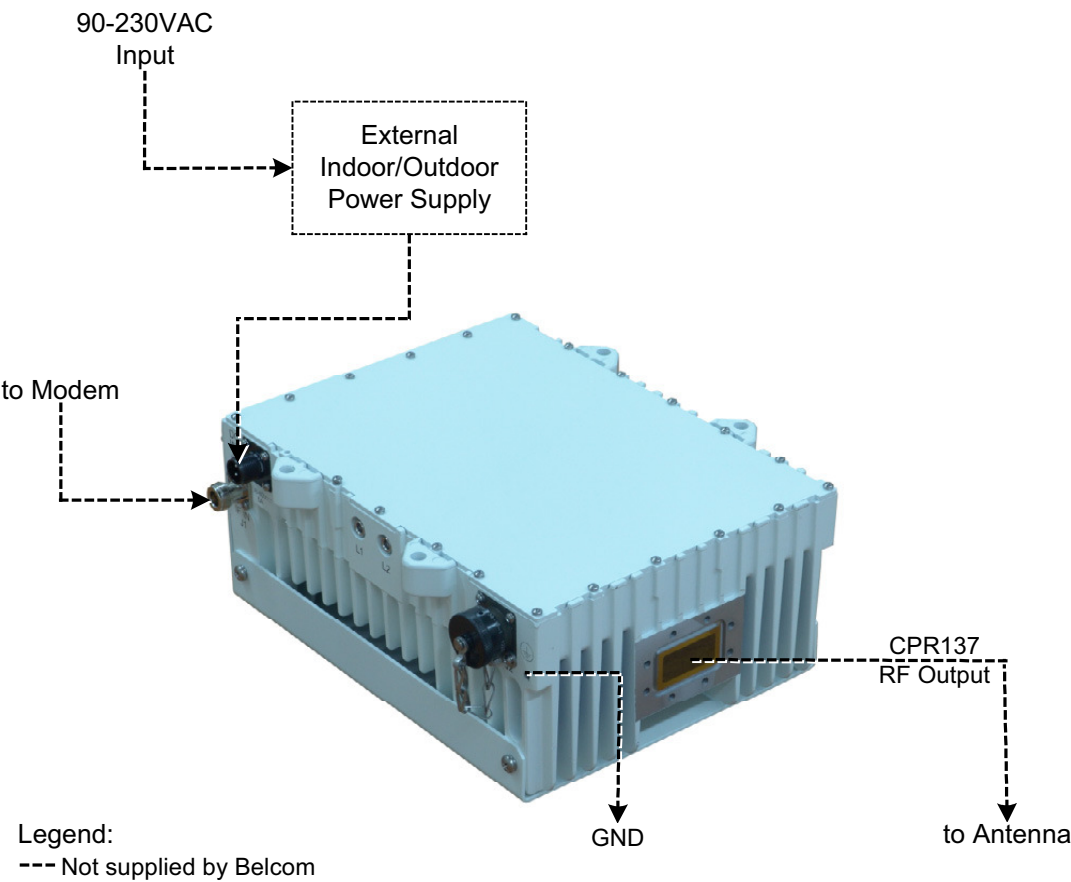
**Figure 2-6:** Sealing the BUC Connectors using a Sealing Tape (example)

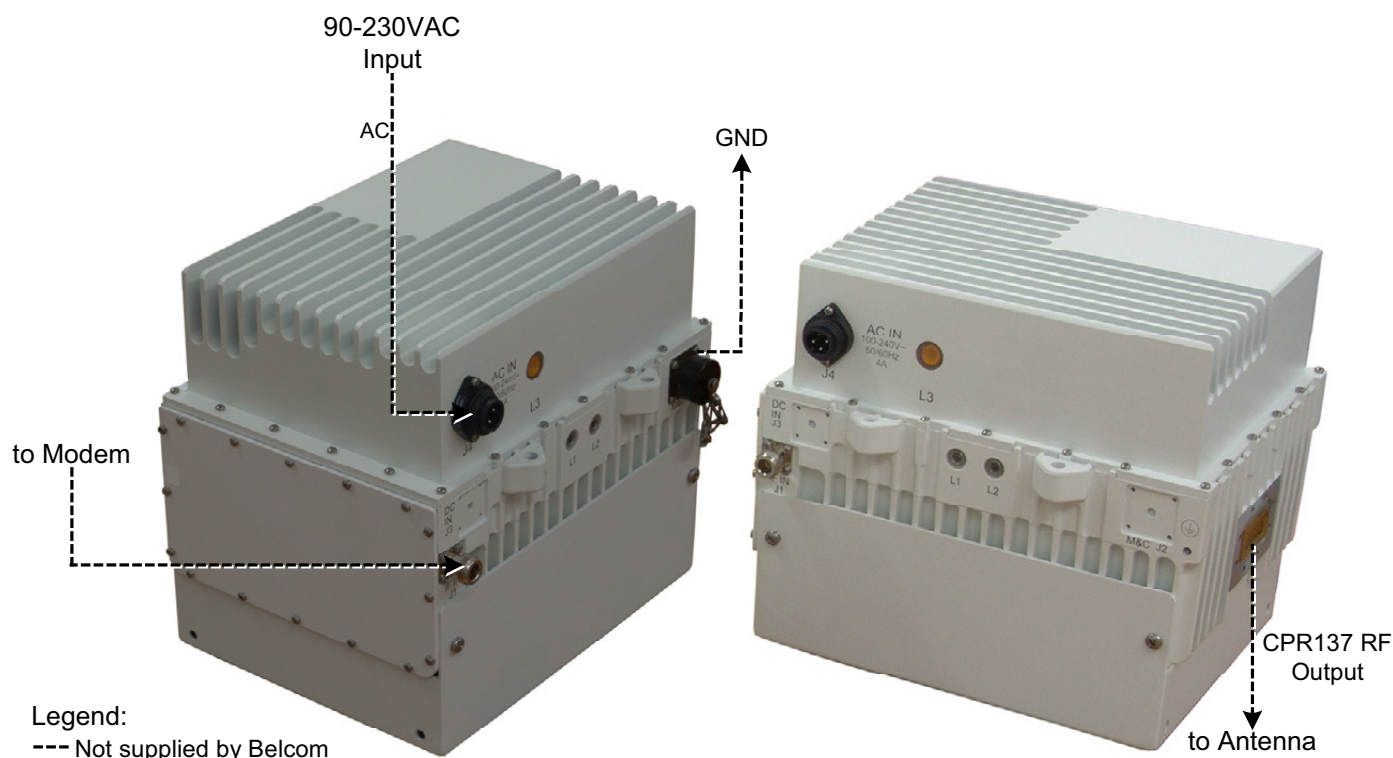


### 2.3.5 BLC-10/20/25/40/50 AC and External DC Cable-Connection

1. Connect the IF output of the modem to the input connector of the BUC (J1), using an appropriate coax cable (not supplied).
2. Connect the BUC CPR137G output to the OMT, using an appropriate waveguide. At the BUC side, use screws kit P/N A10559 (supplied).
3. At the OMT side, use screws kit P/N A11479 (supplied with the optional flexible waveguide).
4. Connect the BUC GND point to the infrastructure ground, using a standard GND cable.
5. AC powered unit: Connect the BUC AC input (J4) to the mains, using an appropriate AC cable (connector supplied, cable assembly procedure in [Appendix](#) or [Appendix](#) ).
6. DC powered unit: Connect the BUC DC input (J3 for 10/20/25 Watt models, J4 for 40/50 Watt models) to the DC supply, using an appropriate DC cable (connector supplied, cable assembly procedure in [Appendix G: BLC-40/50 DC Cable Assembly](#) or [Appendix](#) ).
7. Seal all the connectors on the BUC, using a sealing tape (see [Figure 2-6](#)).

**Figure 2-7: BLC-10/20/25/40/50 AC and External DC Cable-Connection**



**Figure 2-8: BLC-10/20/25/40/50 AC and External DC Cable-Connection**

## 2.4 Post Installation Checks

1. Switch ON the modem, the DC Power Inserter and/or the indoor/outdoor power supply (whatever is applicable).
2. Allow enough initialization time for the modem and make sure that the modem provides 10 MHz reference signal at the output, according to the modem instructions.
3. For a system with a DC Power Inserter: Verify that the POWER SUPPLY indicator, located on the DC Power Inserter front panel, is ON and the HIGH CURRENT and LOW CURRENT indicators are OFF.
4. BUC indicators:  
For AC and 40/50 Watt DC models: Verify that the AC indicator is ON.  
Verify that L1 (white) is ON and L2 (green) is ON.
5. Verify fan operation.

The system is now ready for transmission. In any case of malfunctioning, refer to chapter 3 for troubleshooting.



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## 3. Maintenance

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This chapter provides a list of procedures to be carried out while using the BLC-10/20/25/40/50. The chapter includes the following sections:

- Section [3.1: Preventive/Scheduled Maintenance Activities](#)
- Section [3.2: BUC Troubleshooting](#)
- Section [3.3: BUC Possible Failures and Causes](#)
- Section [3.4: DC Power Inserter Troubleshooting](#)
- Section [3.5: Corrective Maintenance - Fan Replacement](#)



### **WARNING**

When servicing the BUC, follow all safety instructions related to transmitting antennas maintenance.

### 3.1 Preventive/Scheduled Maintenance Activities

Perform the following annually:

1. Verify that all connectors are properly sealed.
2. Verify fan rotation and free airflow.

## 3.2 BUC Troubleshooting

### 3.2.1 BUC Indication Lights

There are three LED indicators on the BUC (Two LED indicators in BLC 10/20/25-DC ). L3 LED in the AC Powered BUCs and BLC 40/50-DC) indicates that the BUC receives input supply power.

[Table 3-1](#) explains the functions of the BUC indication lights.

**Table 3-1: BUC Indication Lights**

L1 (White)	L2 (Green/Red)	Indication
ON	Green	Normal operation
ON	Red 1 Hz blinks	The BUC is muted
OFF	Red	10 MHz reference power level below minimum
OFF	OFF	Input DC supply voltage below minimum Or Internal power supply fault
ON	Green 1 Hz blinks	External power supply or modem overload
ON	Red 5 Hz blinks	BUC temperature is above the maximum allowed value. The BUC shuts down automatically and resume operation after 10 minutes
ON	Red	Missing or instable 10 MHz reference frequency Or Internal fault
ON	Red 2 blinks	Fan fault (BLC-40/50 S/N 200 and above)
ON	Red 3 blinks	High reflected power (with M&C option only)



### 3.3 BUC Possible Failures and Causes

**NOTE**

If a unit is suspected as malfunctioning, it is recommended to replace it with a serviceable one (if available), using the same cables and position. This action will indicate whether the fault is in the unit or in another part of the system.

#### 3.3.1 Problem: No Output Power

List of Possible causes:

- [Missing Power Supply](#)
- [Power Supply Low Voltage](#)
- [Internal Temperature Protection Activated](#)
- [Missing, Low or Unstable 10 MHz Reference](#)
- [Missing IF Signal](#)

Check the indication of each of the possible causes and act according to the instructions as described below:

##### 3.3.1.1 Missing Power Supply

Indications:

- System (modem or control center) indicates no uplink signal.
- BUC indication lights L1, L2 are OFF.
- BUC surface temperature remains low after 15 minutes.
- Fan is not rotating.

**Further checks and remedy:**

- Models with DC supplied via the IFL cable:
  - Check IFL cable connection (see Section [3.3.1.5](#)).
  - Verify that DC Power Inserter is ON and in normal operation (whenever applicable).
  - Verify DC voltage (24 or 48 VDC) at the IFL cable end (BUC side).
- Modules with external AC/ DC supply:
  - Check DC or AC supply.
  - Check power supply cable connections.

If the power supply and its connections are OK, then replace the BUC.

### 3.3.1.2 Power Supply Low Voltage

**Indications:**

- System indicates no uplink signal.
- BUC indication lights: L1 off, L2 blinks at 1 Hz.

**Further checks and remedy:**

- IFL DC supply models:
  - Check DC Power Inserter indications (see Section 3.4) or modem DC power rating.
  - Check IFL cable specified DC resistance and make sure it is below the maximum recommended value (see Table 3-3).
  - Check IFL cable for breaks and improper connectors assembly.
- External DC supply models:
  - Check DC power supply. If the power supply and its connectors are in order, replace the BUC.

### 3.3.1.3 Internal Temperature Protection Activated

**NOTE**

Excessive ambient temperature might trigger the temperature protection: if for any reason the BUCs temperature exceeds 85°C, the BUC shuts down automatically for 10 minutes and then turns ON again.

**Indications:**

- System indicates no uplink signal.
- BUC indication lights: L1 on, L2 red blinks at 5 Hz.

**Further checks and remedy:**

- Let the unit cool down for 15 minutes.
- If possible, prevent direct sun radiation on the unit.
- Verify fan rotation, replace fan if necessary.

### 3.3.1.4 Missing, Low or Unstable 10 MHz Reference

**Indications:**

- System indicates no uplink signal.
- BUC indication lights: L1 – OFF, L2 - red.
- BUC surface temperature remains low after 15 minutes.

**Further checks and remedy:**

Check modem setup. Make sure modem is configured to provide a reference signal.

### 3.3.1.5 Missing IF Signal

**Indications:**

System indicates no uplink signal.

**Further checks and remedy:**

- Check IFL cable for breaks and improper connectors assembly.
- Check indoor equipment cable connection.

### 3.3.2 Problem / Suspicion: Low Output Power

Possible cause: Low IF input level

**Indications:**

- System indicates low uplink power.

**Further checks and remedy:**

- Check IFL cable for breaks and improper connectors assembly.
- Check IFL cable specified attenuation. Assure proper IF level at the IF connector (BUC side).
- Check DC Power Inserter attenuation settings (see Section 3.4).
- Check modem output power setting.
- Check indoor equipment cable connections.

### 3.3.3 Problem / Suspicion: No Output Power

Possible cause: Wrong frequency sense setup in the modem.

**Indications:**

- System indicates no uplink signal or the system do not lock.

**Further checks and remedy:**

- Check modem setup. Verify that the modem is configured for positive frequency sense.

## 3.4 DC Power Inserter Troubleshooting

### 3.4.1 DC Power Inserter Indication Lights

- POWER SUPPLY - Indicates proper output voltage. Turns off when output voltage is below 46V (with standard 48V output voltage) or below 22V (with the 24V output voltage option).
- LOW CURRENT - Indicates output current below 0.8A - The BUC do not draw current from the DC Power Inserter.
- HIGH CURRENT - Indicates output current higher than 6A.

### 3.4.2 DC Power Inserter Possible Failures and Causes

#### 3.4.2.1 Problem: No Output Voltage

Possible cause: Missing AC supply

**Indications:**

- POWER SUPPLY indication - OFF
- Power switch light - OFF

**Further checks and remedy:**

- Turn power switch on.
- Check AC supply.

#### 3.4.2.2 Problem: Low Output Voltage

Possible cause: BUC draws excessive current or short in the IFL cable or connectors

**Indications:**

- POWER SUPPLY indication - OFF
- HIGH CURRENT - ON

**Further checks and remedy:**

- Check IFL cable for shorts
- Check BUC

**3.4.2.3 Problem: Low Output Voltage**

Possible cause: Internal failure

**Indications:**

- Power switch light - ON, POWER SUPPLY indication - OFF

**Further checks and remedy:**

- Replace DC Power Inserter

**3.4.2.4 Problem: Low or Zero Output Current**

Possible cause: IFL cable disconnected or BUC failure

**Indications:**

- POWER SUPPLY indication - ON
- LOW CURRENT - ON

**Further checks and remedy:**

- Check IFL cable for shorts
- Check BUC

**3.4.2.5 Problem: No IF Output Power or Low IF Output Power from the DC Power Inserter**

Possible cause: High IF attenuation in the DC Power Inserter or wrong cable connections.

**Indications:**

- System indicates missing or low uplink signal

**Further checks and remedy:**

- Check cable connections

Using a screwdriver, gradually decrease the attenuation, using the ATT rotary switch and the table below.

**Table 3-2: DCA Attenuation Levels**

Position	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Attenuation [dB]	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30

**Table 3-3: IFL Cable Maximum Permitted Resistance**

Model	DC Max. Power Consumption (W)	Min. Input Voltage to the BUC(V)	* Cable Max. Resistance ( $\Omega$ )
10 W	95	38	4
10 W 24V	95	18	1.3
20 W	170	38	2.2
25 W	210	38	1.8
40/50 W	380	38	1.0

\* A summing of both center conductor and shielding resistance.

## 3.5 Corrective Maintenance - Fan Replacement

### 3.5.1 Replacement Parts

- For BLC-10/20/25 AC&DC Fan with Cable: P/N A1052-FAN-1
- For BLC-40/50 AC&DC Fan with Cable: P/N 1143-FAN-1

### 3.5.2 Tools and Materials

- Philips screwdriver
- Open wrench

### 3.5.3 Procedure

1. Preparations:
  - a. Pending on your configuration, switch OFF the modem, the DC Power Inserter and/or the indoor/outdoor power supply.
  - b. Disconnect all BUC cables.
  - c. Dismantle the BUC.

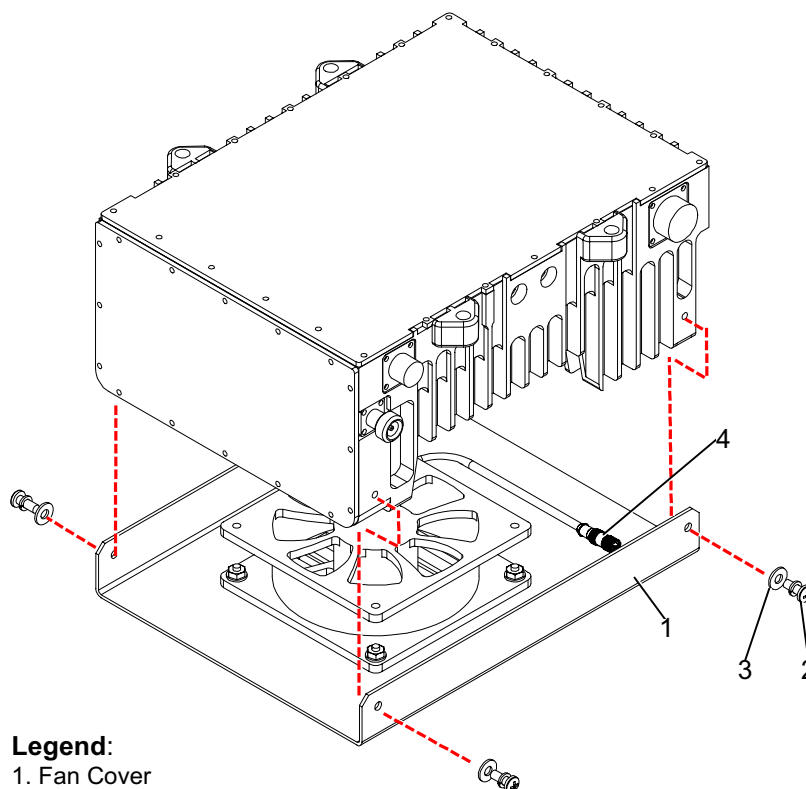


#### NOTE

The replacement work should be performed in a clean area and on an appropriate workbench.

2. Remove the fan cover (1):
  - a. Remove four screws (2) and spring washers (3) fastening the Cover to the chassis.
  - b. Carefully open the cover and disconnect the fan cable-connector (4).

**Figure 3-1: Corrective Maintenance - Fan Replacement (Typical)**



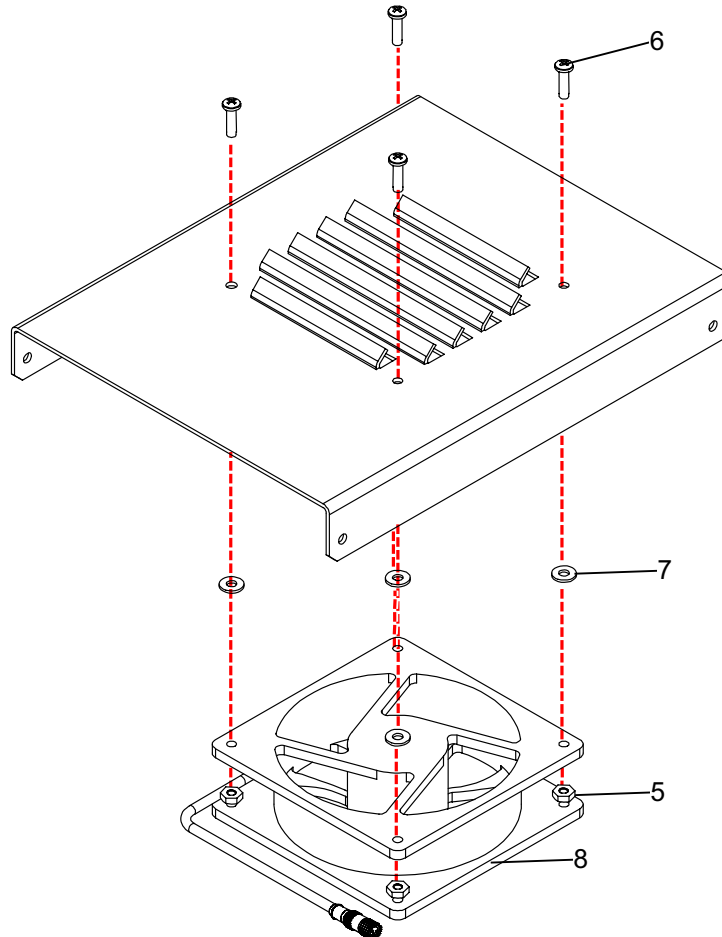
**Legend:**

- 1. Fan Cover
- 2. Screw NF10-32x PH.P, (x4)
- 3. Spring Washer, #10 (x4)
- 4. Fan Cable-Connector

3. BLC-DC and BLC-20/25 AC Models Fan Removal:

- a. While holding the four nuts (5) using an open wrench, remove the four screws (6) and washers (7), fastening the fan (8) to the cover.
- b. Remove the fan (8), the screws (6), the washers (7) and the nuts (5) from the cover.

**Figure 3-2:** *Corrective Maintenance - Fan Replacement for BLC-DC and BLC-20/25 AC Models*



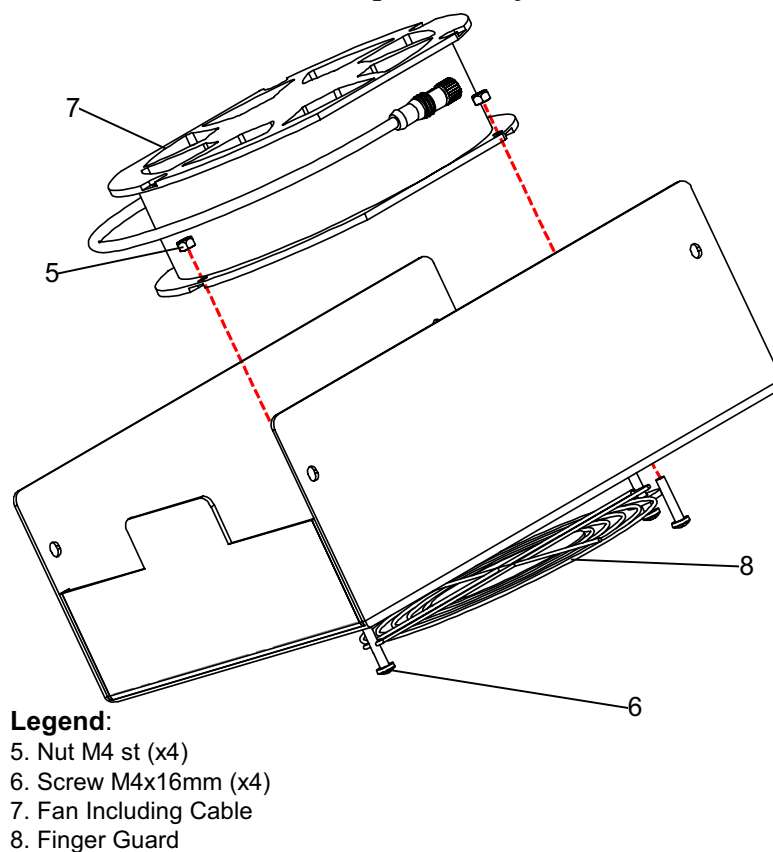
**Legend:**

- 5. Nut M4 st (x4)
- 6. Screw M4x16mm (x4)
- 7. Washer (x4)
- 8. Fan Including Cable



4. BLC-40AC/DC and BLC-50 Models Fan Removal:
  - a. While holding the four nuts (5) using an open wrench, remove the four screws (6), fastening the fan (7) and the finger guard (8).
  - b. Remove the fan (7), the screws (6), the finger guard (8) and the nuts (5) from the cover.

**Figure 3-3: Corrective Maintenance - Fan Replacement for BLC-40 AC/DC and BLC-50 Models**



5. Mount a new fan in a reversed order.
6. Install the BUC(see either Section [2.3.1](#) or Section [2.3.2](#)).
7. Pending on your configuration, re-connect the BUC cables (see Sections [2.3.4](#) - [2.3.5](#)).
8. Operate the BUC(see Section [2.4: Post Installation Checks](#)).

